

This guidance document sets forth EPA's recommended approaches based upon currently available information with respect to risk assessment for response actions at Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) sites (commonly known as Superfund). This document does not establish binding rules. Alternative approaches for risk assessment may be found to be more appropriate at specific sites (e.g., where site circumstances do not match the underlying assumptions, conditions and models of the guidance). The decision whether to use an alternative approach and a description of any such approach should be documented. Accordingly, when comments are received at individual sites questioning the use of the

It should also be noted that calculating a PRG addresses neither human radionuclide dose or noncancer toxicity, nor potential ecological risk. Of the radionuclides generally found, at CERCLA sites, only uranium has potentially significant noncancer toxicity. When assessing sites with uranium as a contaminant, it may also be necessary to consider the noncancer toxicity of uranium, using other tools, such as EPA's Regional Screening Levels (RSLs) for Chemical Contaminants at Superfund Sites electronic calculator for uranium in soil, water, and air, and the WTC for uranium inside buildings. EPA's SPRG Calculator should be used to assess radionuclide cancer risk for hard outside surfaces, and the BPRG Calculator for radionuclide cancer risk inside buildings. EPA's DCC Calculator should be used to assess radionuclide dose for soil, water, and air, BDCC Calculator for radionuclide dose inside buildings, and the SDCC Calculator for radionuclide dose for hard outside surfaces. Similarly, some sites with radiological

This web calculator may be used to develop generic PRGs for radionuclides for several different exposure scenarios. The calculator is flexible and may be used to derive site-specific PRGs as more site characterization is obtained (EPA 2000a). Models reviewed by EPA in the [Soil Screening Guidance for Radionuclides: Technical Background Document](#) are presented in Section 3-2. This report provides a detailed technical analysis of five unsaturated zone fate and transport models for radionuclides. This report supports the information provided in [Part 3 - Unsaturated Zone Models for Radionuclide Fate and Transport \[PDF 383KB, 25 pages\]](#) of the [Soil Screening Guidance for Radionuclides: Technical Background Document](#) on determining the general applicability of the models to surface conditions, and an assessment of each model's potential applicability to the soil screening process.

## 1. Introduction

A purpose of this guidance is to provide a PRG calculation tool to assist risk assessors, remedial project managers, and others involved with risk assessment and decision-making at CERCLA sites in developing PRGs. This database is based on [Risk Assessment Guidance for](#)

should assist staff in streamlining the consideration of remedial alternatives. Chemical-specific PRGs are from two general sources. These are: (1) concentrations based on potential Applicable or Relevant and Appropriate Requirements (ARARs) and (2) risk-based concentrations. ARARs include concentration limits set by other environmental regulations such as Safe Drinking Water Act maximum contaminant levels (MCLs). The second source for PRGs, and the focus of this database tool, is risk-based calculations that set concentration limits using carcinogenic toxicity values under specific exposure conditions.

The recommended approach for developing remediation goals is to identify PRGs at scoping, modify them as needed at the end of the RI or during the FS based on site-specific information from the baseline risk assessment, and ultimately select remediation levels in the Record of Decision (ROD). In order to set radionuclide-specific PRGs in a site-specific context, however, assessors must answer fundamental questions about the site. Information on the radionuclides that are present onsite, the specific contaminated media, land-use assumptions, and the exposure assumptions behind pathways of individual exposure is necessary in order to develop radionuclide-specific PRGs. The PRG calculator provides the ability to modify the standard default PRG exposure parameters to calculate site-specific PRGs.

PRGs are presented for resident soil, outdoor worker soil, indoor worker soil, composite worker soil, recreator soil, farmer soil, construction worker soil, tap water, air, farm products and fish ingestion. The risk-based PRGs for radionuclides are based on the carcinogenicity of the contaminants. Cancer slope factors (SFs) used are provided by the [Center for Radiation Protection Knowledge](#). The main report is [Calculations of Slope Factors and Dose Coefficients](#) and the tables of slope factors are in a separate [appendix](#).

Non-carcinogenic effects are not considered for radionuclide analytes, except for uranium for which both carcinogenic and non-carcinogenic effects are considered. To determine PRGs for the chemical toxicity of uranium, and for other chemicals, go to the [Regional Screening Levels for Chemical Contaminants at Superfund Sites](#) webpage.

The standardized PRGs are based on default exposure parameters and incorporate exposure factors that present RME conditions. This database tool presents PRGs in both activity and mass units. Once this database tool is used to retrieve standard PRGs or calculate site-specific PRGs, it is important to clearly demonstrate the equations and exposure parameters used in the calculations. Discussion of the assumptions that go into the PRGs calculated should be included in the document where the PRGs are presented such as a Remedial Investigation (RI) Report or Feasibility Study.

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### 3.1 Developing a Conceptual Site Model

When using PRGs, the exposure pathways of concern and site conditions should match those taken into account by the screening levels. (Note, however, that future uses may not match current uses. Future uses of a site should be logical as conditions which might occur at the site in the future.) Thus, it is necessary to develop a conceptual site model (CSM) to identify likely contaminant source

areas, exposure pathways, and potential receptors. This information can be used to determine the applicability of screening levels at the site and the need for additional information. The final CSM diagram represents linkages among contaminant sources, release

### 3.3 Potential Problems and Limitations

As with any risk-based tool, the potential exists for misapplication. In most cases, this results from not understanding the intended use of the PRGs. In order to prevent misuse of the PRGs, the following should be avoided:

- Applying PRG levels to a site without adequately developing a conceptual site model that identifies relevant exposure pathways and exposure scenarios.
- Use of PRG levels as cleanup levels without the consideration of other relevant criteria such as ARARs.
- Use of PRG levels as cleanup levels without verifying numbers with a health physicist/risk assessor.
- Use of outdated PRG levels tables that have been superseded by more recent publications.
- Not considering the effects from the presence of multiple isotopes.
- Not considering the individual model limitations as described in section 4 (e.g., inhalation of tapwater only considers C-14, H-3, Ra-224, Ra-226, Rn-220, and Rn-222).

### FAQ

Chemical concentrations above the PRG would not automatically designate a site as "dirty" or trigger a response action. Exceeding a PRG, however, suggests that further evaluation of the potential excess lifetime cancer risk (ELCR) that may be posed by site contaminants is appropriate. PRGs are also useful tools for identifying initial cleanup goals at a site. In this role, PRGs provide long-term targets to use during the analysis of different remedial alternatives. By developing PRGs early in the decision-making process, design staff may be able to streamline the consideration of remedial alternatives.